WHAT IS CLAIMED IS:

1. A computer implemented method of verifying events generated by an agent, said method comprising:

    detecting an input signal at an input of said agent;

5   generating an expected output signal based at least in part on said input signal;

    detecting an output signal at an output of said agent, wherein said output signal is a translation of said input signal generated by said agent; and

10   comparing said output signal with said expected output signal to verify whether said agent produced said output signal correctly based on said input signal.

2. The method of claim 1, further comprising signaling an error if said output signal does not correctly match said expected output signal.

3. The method of claim 1, further comprising signaling an error if said output signal has no corresponding expected output signal.

4. An apparatus for producing expectations to verify events generated by an agent; comprising:

    a.   at least one computer readable medium; and

    b.   computer readable program code stored on said

5   at least one computer readable medium, said computer readable program code comprising:

        i.   program code for monitoring at least one input of said agent for a stimulus;

        ii. program code for producing an expectation

10   of an event, wherein said event is

> expected to be generated by said agent as a result of said stimulus; and
>
> iii. program code for monitoring at least one output of said agent for said event.

5. The apparatus of claim 4, further comprising program code for signaling an error if said event is not detected at said at least one output.

6. The apparatus of claim 4, further comprising program code for signaling an error if said an event is detected at said at least one output for which no expectation has been produced.

7. The apparatus of claim 4, wherein said program code for monitoring said at least one input of said agent for said stimulus comprises program code for monitoring at least one input of a memory agent for said stimulus, said stimulus being selected from a group consisting of an initial request to perform a memory operation, a snoop response, and a read response.

8. The apparatus of claim 4, wherein said program code for monitoring said at least one input of said agent for said stimulus comprises program code for identifying said stimulus using correlative information in said stimulus.

9. The apparatus of claim 8, wherein said correlative information comprises a transaction identification.

10. The apparatus of claim 8, wherein said correlative information comprises an address of memory being accessed by said stimulus and an identity of a source of said stimulus.

11.   The apparatus of claim 4, wherein said program code
for monitoring said at least one input of said agent for
said stimulus comprises program code for gathering said
stimulus from a plurality of separately transmitted
5   portions.

12.   The apparatus of claim 11, wherein said program code
for gathering said stimulus from said plurality of
separately transmitted portions comprises program code
for establishing a watch list, said watch list containing
5   an entry for each stimulus for which said separately
transmitted portions are being awaited, and wherein said
program code for monitoring said at least one input of
said agent for said stimulus comprises:
        program code for detecting one of said
10   separately transmitted portions at said at least one
        input;
        program code for searching said watch list for
said stimulus for which said one of said separately
transmitted portions was being awaited; and
15   program code for adding said one of said
separately transmitted portions to said stimulus.

13.   The apparatus of claim 4, wherein said program code
for producing said expectation of said event comprises
program code for creating a transaction record to contain
information relating to a memory transaction involving
5   said agent.

14.   The apparatus of claim 13, wherein said program code
for producing said expectation of said event further
comprises:
        program code for creating an expectation record

-39-

5   to contain information relating to an expected event
       from said agent; and
              program code for associating said expectation
       record with said transaction record.

       15. The apparatus of claim 4, wherein said program code
       for producing said expectation of said event comprises
       program code for storing expected data associated with
       said expectation, said expected data being received in a
5   plurality of separate incoming transmissions in said
       stimulus, said expected data being expected to be
       transmitted by said agent in a plurality of separate
       outgoing transmissions in said event.

       16. The apparatus of claim 15, further comprising:
              program code for comparing said expected data
       with actual data in said event;
              program code for signaling an error if said
5   expected data does not match said actual data; and
              program code for signaling an error if said
       actual data is not expected.

       17. The apparatus of claim 15, further comprising
       program code for signaling an error if any of said
       plurality of separate outgoing transmissions is detected
       before all of said plurality of separate incoming
5   transmissions have been received.

       18. The apparatus of claim 15, wherein said program code
       for monitoring said at least one output of said agent for
       said event begins monitoring said at least one output for
       said plurality of separate outgoing transmissions as soon
5   as a first of said plurality of separate incoming
       transmissions has been received.

19. The apparatus of claim 18, wherein said program code for storing said expected data comprises identifying said first of said plurality of separate incoming transmissions using correlative information in said first
5   of said plurality of separate incoming transmissions and further comprising identifying subsequent transmissions of said plurality of separate incoming transmissions by their being contiguously transmitted on a same input of said agent as said first.

20. The apparatus of claim 19, wherein said same input of said agent comprises a same physical and virtual input channel.

21. The apparatus of claim 18, wherein said program code for storing said expected data comprises identifying each of said plurality of separate incoming transmissions using correlative information in said each of said
5   plurality of separate incoming transmissions to enable gathering and sorting of interleaved transmissions belonging to different stimuli.

22. An apparatus for testing an agent in a computer system, comprising:
          means for detecting at least one incoming message as it is received by said agent;
5   means for determining at least one expected outgoing message that should be produced by said agent in response to said incoming message; and
          means for verifying whether said agent generates an outgoing message matching said expected
10   outgoing message.